

(12) INTERNATIONAL PUBLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
9 October 2003 (09.10.2003)

PCT

(10) International Publication Number
WO 2003/084006 A3

(51) International Patent Classification⁷: **H01S 5/14**

(DK). BØGH, Niels-Søren [DK/DK]; Mejerivaenge 30, DK-8370 Hadsten (DK).

(21) International Application Number:
PCT/DK2003/000213

(74) Agent: **ZACCO DENMARK A/S**; Hans Bekkevolds Allé 7, DK-2900 Hellerup (DK).

(22) International Filing Date: 2 April 2003 (02.04.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
PA 2002 00489 3 April 2002 (03.04.2002) DK
PA 2002 01889 10 December 2002 (10.12.2002) DK

(71) Applicant (for all designated States except US):
ESKO-GRAPHS A/S [DK/DK]; Industriparken 35-37, DK-2750 Ballerup (DK).

(81) Designated States (national): AE, AG, AL, AM, AT (utility model), AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ (utility model), CZ, DE (utility model), DE, DK (utility model), DK, DM, DZ, EC, EE (utility model), EE, ES, FI (utility model), FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK (utility model), SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

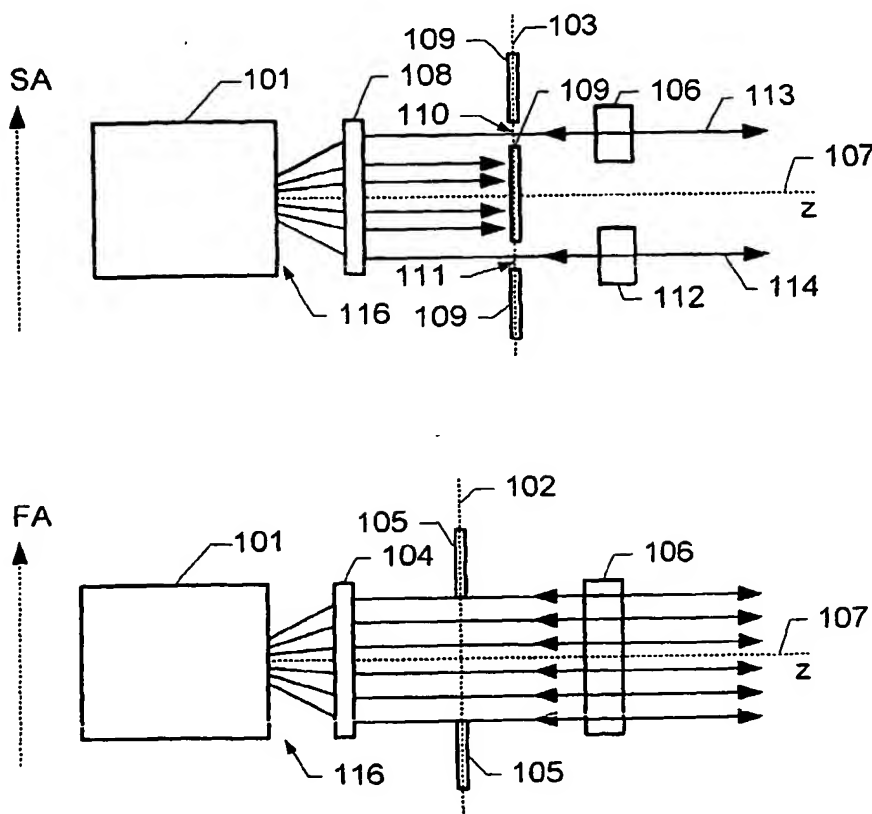
(72) Inventors; and

(75) Inventors/Applicants (for US only): **NIELSEN, Martin, Egede** [DK/DK]; Svendsgade 5A, Dk-9000 Aalborg

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,

[Continued on next page]

(54) Title: **LASER SYSTEM**



(57) Abstract: A laser system for generating a least two output beams comprising a laser multimode diode member (101) emitting a light beam with an intensity distribution comprising a plurality of spatial modes. A dual feedback cavity is provided by first and second selection means (108,110,111) for selecting corresponding to one of said plurality of spatial modes on opposite sides of the optical axis; and first and second reflective members (106,112) where the laser diode member and the reflective members define a dual cavity and are adapted to reflect corresponding feedback fractions of the selected parts of the emitted light beam back into the laser diode member and to produce respective output beams (113,114).



ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(88) Date of publication of the international search report:
31 December 2003

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/03/00213

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01S5/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01S

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 212 216 B1 (PILLAI RAMADAS M R) 3 April 2001 (2001-04-03) column 3-5; figures 1-5 column 9, line 45-55 column 11, line 48-60	1, 12, 14, 15, 18
A	US 4 995 050 A (WAARTS ROBERT G ET AL) 19 February 1991 (1991-02-19) column 3, line 29 -column 4, line 30; figures 1-3	1, 12, 14, 15, 18

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

* & * document member of the same patent family

Date of the actual completion of the international search

25 September 2003

Date of mailing of the international search report

06/10/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax (+31-70) 340-3016

Authorized officer

Claessen, L

INTERNATIONAL SEARCH REPORT

International Application No

PCT/03/00213

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JENSEN S J ET AL: "STABILITY OF THE SINGLE-MODE OUTPUT OF A LASER DIODE ARRAY WITH PHASE CONJUGATE FEEDBACK" APPLIED PHYSICS LETTERS, AMERICAN INSTITUTE OF PHYSICS. NEW YORK, US, vol. 76, no. 5, 31 January 2000 (2000-01-31), pages 535-537, XP000934642 ISSN: 0003-6951 the whole document	1
A	WO 02 21651 A (PETERSEN PAUL MICHAEL ;PURUP ESKOFOT AS (DK)) 14 March 2002 (2002-03-14) cited in the application the whole document	1-18

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/03/00213

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6212216	B1	03-04-2001	AU 4897897 A WO 9815994 A1	05-05-1998 16-04-1998
US 4995050	A	19-02-1991	NONE	
WO 0221651	A	14-03-2002	DK 200001321 A AU 8754501 A WO 0221651 A1 EP 1338063 A1 US 2003165165 A1	06-03-2002 22-03-2002 14-03-2002 27-08-2003 04-09-2003